1/9/18 "A mistake is food for a new invention." -Anonymous

HW: "Domain and Range" w/s Homework side
Test 3 on Tuesday 1/16

AIM: What are the domain and range of functions?

Warm Up:

description = Discriminant

The roots of the equation $ax^2 + 4x = -2$ are real, rational, and equal when a has a value of

(1) 1
(2) 2
(3) 3
(4) 4

$+2 \quad +2$

$ax^2 + 4x + 2 = 0$
$a \quad b \quad c$

$b^2 - 4ac = 0$

$4^2 - 4a(2) = 0$

$16 - 8a = 0$

$+8a \quad +8a$

$\frac{16}{8} = \frac{8a}{8}$

$a = 2$

Domain of a function:

All of the possible inputs (independent variable)

(x-values)

✱ Graphically - left to right

Range of a function:

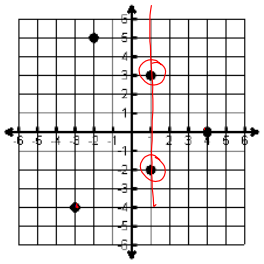
All of the possible outputs (dependent variable)

(y-values)

✱ Graphically - bottom to top

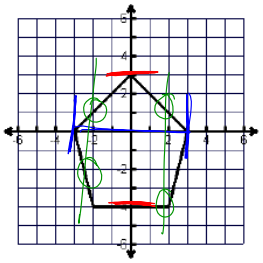
State the domain and range for each graph and then tell if the graph is a function (write yes or no).

1) Domain $\{-3, -2, 1, 4\}$ ← x-values
Range $\{-4, -2, 0, 3, 5\}$ ← y-values
Function? No

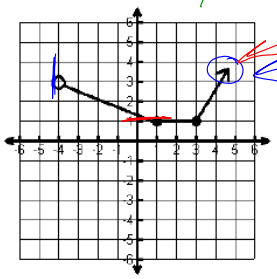


Fails the V.L.T.

2) Domain $-3 \leq x \leq 3$ or $[-3, 3]$
Range $-4 \leq y \leq 3$ or $[-4, 3]$
Function? No



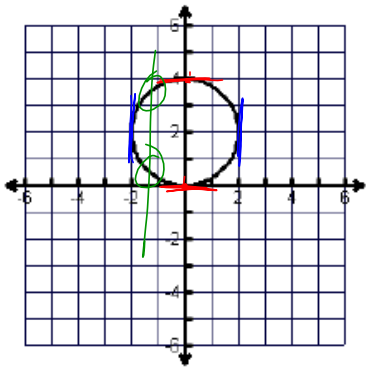
3) Domain $(-4, \infty)$ or $x > -4$
Range $[1, \infty)$ or $y \geq 1$
Function? yes



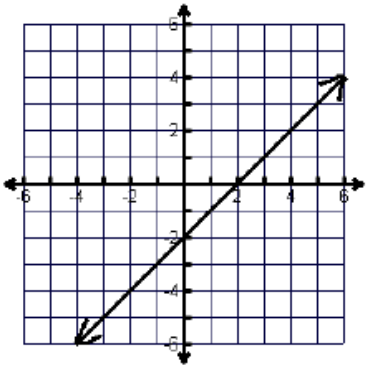
Keep going

Keep going

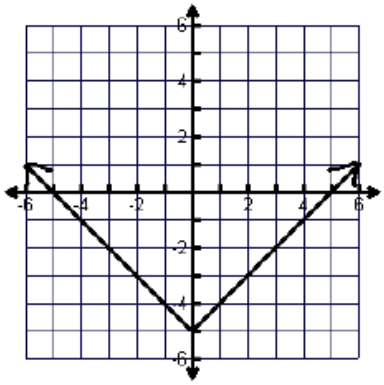
4) Domain $[-2, 2]$ $-2 \le x \le 2$
Range $[0, 4]$ $0 \le y \le 4$
Function? No



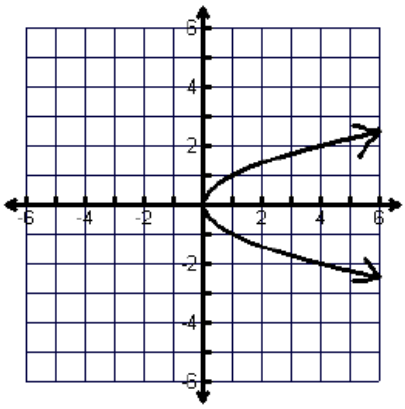
5) Domain $(-\infty, \infty)$
Range $(-\infty, \infty)$
Function? yes



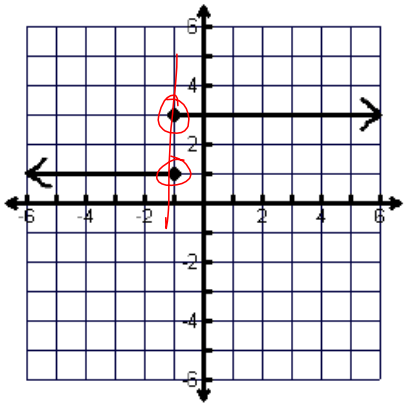
6) Domain $(-\infty, \infty)$
Range $[-5, \infty)$
Function? yes



7) Domain $[0, \infty)$
Range $(-\infty, \infty)$
Function? No



8) Domain $(-\infty, \infty)$
Range $\{1, 3\}$
Function? No!



9) Domain $(-\infty, 2)$
Range $[-2, \infty)$
Function? Yes